WHAT IS CLAIMED IS:

1. A position detection method for detecting the position of an object upon receiving light from a plurality of position detection marks on the object, comprising:

an image information acquisition step of obtaining image information of the position detection marks from the light that has been received;

a conversion step of converting the image information to a light-intensity signal for each line of a plurality of lines partitioned in a direction substantially orthogonal to a direction in which the position detection marks are detected;

a determination step of determining whether the light-intensity signal of each line is valid or not; and

a position information calculation step of calculating position information of the position detection marks from light-intensity signals of valid lines.

2. The method according to claim 1, wherein said determination step includes finding intervals of the position detection marks and determining that a valid light-intensity signal is a light-intensity signal of a line for which a deviation with respect to an average signal of the mark intervals found for all lines is less than a pred termined value.

3. The method according to claim 1, further comprising:

an error information calculation step of calculating information representing an error of a position detection mark, which corresponds to the position information, with respect to a reference position; and

a residual-error information calculation step of calculating residual-error information that is the result of eliminating a prescribed error component from the information representing the error;

wherein said determination step includes determining that a light-intensity signal of a line for which the residual-error information is less than a predetermined value is valid.

4. The method according to claim 1, wherein the object is a semiconductor substrate supplied to a semiconductor manufacturing process, and the position detection marks include at least one of a preceding-step mark formed by etching at a preceding step and a present-step mark formed by a resist at a step that follows said preceding step.

5. The method according to claim 1, wherein the object is a semiconductor substrate supplied to a semiconductor manufacturing process, and the position detection marks include at 1 ast one of a preceding-st p mark formed by etching at a preceding step and a

present-step mark formed by a resist at a step that follows said preceding step; and

said error-information calculation step calculates information representing an error between the preceding-step mark and the present-step mark.

6. The method according to claim 1, wherein a position detection mark is provided also in the direction that is substantially orthogonal to the direction in which the position detection marks are detected, and said image information acquisition step further calculates image information of this position detection mark in the direction substantially orthogonal to the direction in which the position detection marks are detected.

7. The method according to claim 1, wherein said image information acquisition step calculates image information that has been rotated through a predetermined angle with respect to the direction in which the position detection marks are detected.

8. The method according to claim 3, wherein if x and y directions are taken as mutually orthogonal directions having the reference position as the origin thereof, the information representing the error is represented, as a deviation in the position of the position detection mark from the reference position, by shift Sx in the x direction, shift Sy in the y direction, inclination θx with respect to the x axis,

inclination θy with respect to the y axis, magnification Bx along the x direction and magnification By along the y direction, and the prescribed error component is obtained in accordance with the following equation:

$$D'i = \begin{pmatrix} Bx & -\theta y \\ \theta x & By \end{pmatrix} Di + \begin{pmatrix} Sx \\ Sy \end{pmatrix}$$

9. A position detection apparatus for detecting the position of an object upon receiving light from a plurality of position detection marks on the object, comprising:

an image information acquisition unit for obtaining image information of the position detection marks from the light that has been received;

a conversion unit for converting the image information to a light-intensity signal for each line of a plurality of lines partitioned in a direction substantially orthogonal to a direction in which the position detection marks are detected;

a determination unit for determining whether the light-intensity signal of each line is valid or not; and

a position information calculation unit for calculating position information of the position detection marks from light-intensity signals of valid lines.

10. The apparatus according to claim 1, further

comprising an error information calculation unit for calculating error information representing an error of a position detection mark, which corresponds to the position information, with respect to a reference position.

11. An exposure apparatus having a stage device driven in order to position the object based upon error information calculated by the position detection apparatus set forth in claim 10;

said stage device positioning a substrate or a reticle or both as the object.

12. A method of manufacturing a semiconductor device, comprising the steps of:

placing a group of manufacturing equipment for various processes, inclusive of the exposure apparatus set forth in claim 11, in a plant for manufacturing semiconductor devices; and

manufacturing a semiconductor device by a plurality of processes using this group of manufacturing equipment.

13. The method according to claim 12, further comprising:

interconnecting the group of manufacturing equipment by a local-area network; and

communicating, by data communication, information relating to at least one piece of manufacturing equipment in said group thereof between the local-area

network and an external network outside said plant.

14. The method according to claim 13, wherein maintenance information for said manufacturing equipment is obtained by accessing, by data communication via the external network, a database provided by a vendor or user of said exposure apparatus, or production management is performed by data communication with a semiconductor manufacturing plant other than said first-mentioned semiconductor manufacturing plant via the external network.

15. A semiconductor manufacturing plant, comprising:

a group of manufacturing equipment for various processes, inclusive of the exposure apparatus set forth in claim 11;

a local-area network for interconnecting the group of manufacturing equipment; and

a gateway for making it possible to access, from said local-area network, an external network outside the plant;

whereby information relating to at least one of the pieces of manufacturing equipment can be communicated by data communication.

16. A method of maintaining the exposure apparatus, which is set forth in claim 11, installed in a semiconductor manufacturing plant, comprising the steps of:

providing a maintenance database, which is

connected to an external network of the semiconductor manufacturing plant, by a vendor or user of the exposure apparatus;

allowing access to said maintenance database from within the semiconductor manufacturing plant via said external network; and

transmitting maintenance information, which is stored in said maintenance database, to the side of the semiconductor manufacturing plant via said external network.

17. The apparatus according to claim 11, further comprising a display, a network interface and a computer for running network software;

wherein maintenance information relating to said exposure apparatus is capable of being communicated via a computer network by data communication.

18. The apparatus according to claim 17, wherein the network software provides said display with a user interface for accessing a maintenance database, which is connected to an external network of a plant at which said exposure apparatus has been installed, and which is provided by a vendor or user of the exposure apparatus, thereby making it possible to obtain information from said database via said external network.